

Docket No. 501.39158CX1
Serial No. 10/770,413
Office Action dated March 28, 2005

AMENDMENTS TO THE CLAIMS:

The following listing of claims replaces all prior listings, and all prior versions, of claims in the application.

LISTING OF CLAIMS:

1. (Currently Amended) A method of manufacturing semiconductor integrated circuit devices, comprising the steps of:
- (a) forming a photoresist film on a main surface of a wafer;
 - (b) mounting the wafer provided with the photoresist film on a wafer stage of an exposure apparatus;
 - (c) exposing a first phase shift mask pattern having phase errors or random defects on a first region of the main surface of the wafer mounted on the wafer stage by reduction projection exposure using ultraviolet light; and
 - (d) after the step (c), exposing a second phase shift mask pattern formed over the same main surface of the same wafer as the first phase shift mask pattern, on the first region of the main surface of the wafer mounted on the wafer stage by reduction projection exposure using ultraviolet, the second phase shift mask pattern having phase errors or random defects; ~~and a phase thereof inverted from a phase of the first phase shift mask pattern;~~
- ~~wherein the first and second phase shift masks have an area having a plurality of hole patterns and another area having a hole pattern surrounded by auxiliary patterns~~

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wherein the first phase shift mask pattern has a first layout pattern comprising a plurality of hole patterns and a hole pattern surrounded by auxiliary patterns,

wherein the second phase shift mask pattern has a second layout pattern comprising a plurality of hole patterns and a hole pattern surrounded by auxiliary patterns,

wherein the first layout pattern is the same as the second layout pattern,
and

wherein a phase of the light passing through each hole pattern of the first layout pattern is inverted from a phase of the light passing through each hole pattern of the second layout pattern corresponding to the hole pattern of the first layout pattern.

2. (Original) A method according to claim 1, wherein the steps (c) and (d) are exposed by scanning exposure.

3. (Original) A method according to claim 1, wherein the first and second phase shift masks have a substrate groove shifter.

4. (Original) A method according to claim 1, wherein a lighting of the reduction projection exposure is a deformation lighting.

5. (Original) A method according to claim 4, wherein the deformation lighting is an oblique lighting.

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6. (Original) A method according to claim 4, wherein the deformation lighting is a bracelet-lighting.

7. (Currently Amended) A method of manufacturing semiconductor integrated circuit devices, comprising the steps of:

(a) forming a photoresist film on a main surface of a wafer;

(b) mounting the wafer provided with the photoresist film on a wafer stage of an exposure apparatus;

(c) exposing a first phase shift mask pattern having phase errors or random defects on a first region of the main surface of the wafer mounted on the wafer stage by reduction projection exposure using ultraviolet light; and

(d) after the step (c), exposing a second phase shift mask pattern as the first phase shift mask pattern, on the first region of the main surface of the wafer mounted on the wafer stage by reduction projection exposure using ultraviolet, the second phase shift mask pattern having phase errors or random defects; ~~and a phase thereof inverted from a phase of the first phase shift mask pattern;~~
~~wherein the first and second phase shift masks have an area having a plurality of hole patterns and another area having a hole pattern surrounded by auxiliary patterns.~~

wherein the first phase shift mask pattern has a first layout pattern comprising a plurality of hole patterns and a hole pattern surrounded by auxiliary patterns.

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wherein the second phase shift mask pattern has a second layout pattern comprising a plurality of hole patterns and a hole pattern surrounded by auxiliary patterns.

wherein the first layout pattern is the same as the second layout pattern.
and

wherein a phase of the light passing through each hole pattern of the first layout pattern is inverted from a phase of the light passing through each hole pattern of the second layout pattern corresponding to the hole pattern of the first layout pattern.

8. (Original) A method according to claim 7, wherein the steps (c) and (d) are exposed by scanning exposure.

9. (Original) A method according to claim 7, wherein the first and second phase shift masks have a substrate groove shifter.

10. (Original) A method according to claim 7, wherein a lighting of the reduction projection exposure is a deformation lighting.

11. (Original) A method according to claim 10, wherein the deformation lighting is an oblique lighting.

12. (Original) A method according to claim 10, wherein the deformation lighting is a bracelet-lighting.

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13. (Currently Amended) A method of manufacturing semiconductor integrated circuit devices, comprising the steps of:

(a) forming a photoresist film on a film to be processed formed on a main surface of a wafer;

(b) mounting the wafer provided with the photoresist film on a wafer stage of an exposure apparatus;

(c) exposing a first phase shift mask pattern having phase errors or random defects on a first region of the main surface of the wafer mounted on the wafer stage by reduction projection exposure using ultraviolet light; and

(d) after the step (c), exposing a second phase shift mask pattern formed over the same main surface of the same wafer as the first phase shift mask pattern, on the first region of the main surface of the wafer mounted on the wafer stage by reduction projection exposure using ultraviolet, the second phase shift mask pattern having phase errors or random defects, ~~and a phase thereof inverted from a phase of the first phase shift mask pattern;~~

~~wherein the first and second phase shift masks have an area having a plurality of hole patterns and another area having a hole pattern surrounded by auxiliary patterns.~~

wherein the first phase shift mask pattern has a first layout pattern comprising a plurality of hole patterns and a hole pattern surrounded by auxiliary patterns.

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wherein the second phase shift mask pattern has a second layout pattern comprising a plurality of hole patterns and a hole pattern surrounded by auxiliary patterns.

wherein the first layout pattern is the same as the second layout pattern,
and

wherein a phase of the light passing through each hole pattern of the first layout pattern is inverted from a phase of the light passing through each hole pattern of the second layout pattern corresponding to the hole pattern of the first layout pattern.

14. (Original) A method according to claim 13, wherein the steps (c) and (d) are exposed by scanning exposure.

15. (Original) A method according to claim 13, wherein the first and second phase shift masks have a substrate groove shifter.

16. (Original) A method according to claim 13, wherein a lighting of the reduction projection exposure is a deformation lighting.

17. (Original) A method according to claim 16, wherein the deformation lighting is an oblique lighting.

18. (Original) A method according to claim 16, wherein the deformation lighting is a bracelet-lighting.